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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,120	08/25/2003	Frank Jeroen Pieter Schuurmans	081468-0305605	9830
909	7590	07/27/2004		
PILLSBURY WINTHROP, LLP P.O. BOX 10500 MCLEAN, VA 22102			EXAMINER LEYBOURNE, JAMES J	
			ART UNIT 2881	PAPER NUMBER

DATE MAILED: 07/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Handwritten initials: "H.D."

Office Action Summary	Application No.		Applicant(s)	
	10/647,120		SCHUURMANS ET AL.	
	Examiner		Art Unit	
	James J. Leybourne		2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>082503</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 20030043455 to Singer et al., hereinafter referred to as "Singer '455' ", in view of US 20040065817 to Singer et al., hereinafter referred to as "Singer '817' " and in still further view of Glavish et al. (USPN 4916322).

In Singer '455', Fig. 11, Singer et al. disclose a projection exposure system comprising an extreme ultraviolet illumination system for radiation of wavelength $\leq 0.193 \mu\text{m}$ that comprises a mirror shell reflector assembly **180** comprising a plurality of mirror shells rotationally symmetric around an optical axis. [0003]. There is a reflection reticle **114** and a projection objective **126** that focuses the reticle onto a substrate mounted on table **124** [0040]. The reflectors are coated with a noble metal such as gold or rhodium [0032]. Using grazing incidence, the reflectivity is greater than 70% [0035].

Regarding claims 2-4, 8, 10-12 and 16, Singer '455' does not teach using a radiative layer having an emissivity of between 0.6 and 0.95 or between 0.6 and 0.95 covering the backing layer of the outer reflector, the use of carbon as the backing layer or the use of radiation fins on the outer reflector.

Singer '817' discloses a collector for EUV radiation wherein cooling plates may be laid on the mirror shells so that the heat is removed by radiation [0039].

Glavish et al. teach that, for radiation cooling, providing additional cooling surfaces may increase cooling and that radiation cooling is directly proportional to the emissivity, the area of the sheet and the solid angle. An emissivity of 0.6 is applicable to silicon surfaces and an emissivity of 0.1 is typical of metal surfaces. For this reason metal masks are desirably coated with a material such as graphite (column 9, lines 5-9).

It would be obvious to one of ordinary skill in the art at the time of the invention to provide radiation cooling for the backing layer of the outer reflector, of Singer '455', as taught by Singer '817', using a radiative coating with high emissivity, such as carbon, and to add fins to increase the area as taught by Glavish et al. because Singer '817' teaches radiation cooling is particularly advantageous if deformation would occur between cooling devices and the mirror shell due to thermal expansion [0039].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James J. Leybourne whose telephone number is (571) 272-2478. The examiner can normally be reached on M-F 9:00- 6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on (571) 272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Art Unit: 2881

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July 22, 2004

JJL


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800